

Economist (part time), January 1983–May 1995
Economist (full time), October 1980–December 1982

Regulatory

Analyzed various competitive issues posed by Bell Company entry into long-distance telecommunications services and submitted affidavit to Federal Communications Commission on behalf of Justice Department.

Testimony

Presented expert testimony to courts in successful challenges of merger and of consent decree.

Mergers

Investigated mergers in several industries and helped to design appropriate relief.

Business Practices

Worked on vertical-restraints cases (tying, exclusive dealing, resale price maintenance, exclusive territorial arrangements) and horizontal-conduct cases (collusion and predation).

Legislation, Congressional Matters, Division Reports

Provided input to Antitrust Division's Merger Guidelines (1992) and Vertical Restraints Guidelines (1984). Helped draft Division comments on various Congressional legislation and responses to inquiries in several areas including price discrimination and dealer termination.

Cooperation with Foreign Competition Authorities

Interacted with competition officials from several countries and agencies. Helped comment on following documents: Canadian Fair Trade Commission's guidelines on predatory pricing, and on price discrimination; Japanese Fair Trade Commission's guidelines on distribution systems, on sole import distributorships, and on joint R&D; Korean Fair Trade Commission's guidelines on unfair trade practices in international agreements; OECD papers on predatory pricing, on competition policy and franchising, and on interaction between trade and competition policies.

Other Professional Experience

Senior Advisor, The Brattle Group, Economic, Environmental & Management Counsel, Cambridge, MA and Washington DC, November 1996-present.

OECD: Lecturer in Seminar on Vertical Restraints for competition officials from Czech Republic, Hungary, Poland, and Slovakia in Cracow, Poland, November 20-22, 1995.

Consultant in private antitrust and regulatory matters.

ILADES: Participated in designing and teaching a short course in industrial organization to policymakers and executives in Santiago, Chile, June 1994.

Pew Freedom Fellows Program: Taught short course in microeconomics to twenty Fellows from transition economies, annually, January 1993–present. (Fellows hold middle-level or upper-level positions in government and private business.)

Center for Economic Development, Slovakia: Academic Advisory Board.

World Bank: Consultant.

Abt Associates/USAID: Advised Government of Zimbabwe in Harare on formulating antitrust law, summer 1993 (consultant to Abt, work funded by USAID's Implementing Policy Change Project).

LANGUAGES

French, Hebrew, Romanian (speak and read all three fairly well; write French and Hebrew adequately)

HONORS

U.S. Department of Justice, Antitrust Division: Special Achievement Awards
Brookings Institution: Research Fellow, 1979-80
University of California, Los Angeles: Earhart Fellowship, 1977-78
University of California, Los Angeles: Regents Fellowship, 1976-77
London School of Economics: Premchand Prize in Monetary Economics, 1976

PUBLICATIONS

Refereed Journals

- "A Quality-Signaling Rationale for Aftermarket Tying," *Antitrust Law Journal*, vol. 64 (Winter 1996): 387-404 (with Gregory J. Werden).
- "The Non-Existence of Pairwise-Proof Equilibrium," *Economics Letters*, vol. 49 (1995): 251-259 (with R. Preston McAfee).
- "Equity as a Call Option on Assets: Some Tests for Failed Banks," *Economics Letters*, vol. 48 (1995): 389-397 (with Behzad Diba and Chia-Hsiang Guo).
- "Parallel Imports, Demand Dispersion, and International Price Discrimination," *Journal of International Economics*, vol. 37 (November 1994): 167-195 (with David Malueg).
- "Opportunism in Multilateral Vertical Contracting: Nondiscrimination, Exclusivity, and Uniformity," *American Economic Review*, vol. 84 (March 1994): 210-230 (with R. Preston McAfee).
- "Preemptive Investment, Toehold Entry, and the Mimicking Principle," *RAND Journal of Economics*, vol. 22 (Spring 1991): 1-13 (with David Malueg).
- "Patent Protection through Discriminatory Exclusion of Imports," *Review of Industrial Organization*, vol. 6 (No. 3, 1991): 231-246.
- "Third-Degree Price Discrimination and Output: Generalizing a Welfare Result," *American Economic Review*, vol. 80 (December 1990): 1259-1262.
- "Investments in Oligopoly: Welfare Effects and Tests for Predation," *Oxford Economic Papers*, vol. 41 (October 1989): 698-719.
- "Entry Deterrence Externalities and Relative Firm Size," *International Journal of Industrial Organization*, vol. 6 (June 1988): 181-197 (with Michael Baumann).
- "The Competitive Effects of Vertical Agreements: Comment," *American Economic Review*, vol. 77 (December 1987): 1063-1068.

- "The Nature and Scope of Contestability Theory," *Oxford Economic Papers*, vol. 38 Supplement (November 1986): 37-57.
This issue of the journal was published in parallel as *Strategic Behavior and Industrial Competition*, Morris et al. Eds., Oxford University Press, 1986.
- "The Perverse Effects of the Robinson-Patman Act," *Antitrust Bulletin*, vol. 31 (Fall 1986): 733-757.
- "Divisionalization and Entry Deterrence," *Quarterly Journal of Economics*, vol. 101 (May 1986): 307-321 (with Earl Thompson).
- "Illinois Brick and the Deterrence of Antitrust Violations," *Hastings Law Journal*, vol. 35 (March 1984): 629-668 (with Gregory Werden).
- "Contestable Markets: An Uprising in the Theory of Industry Structure: Comment," *American Economic Review*, vol. 73 (June 1983): 488-490 (with Robert Reynolds).

Monographs, Book Reviews, and Other Publications

- "Telecommunications Reform in the United States: Promises and Pitfalls," in Paul J.J. Welfens and George Yarrow, Eds., *Telecommunications and Energy in Systemic Transformation*, Heidelberg and New York: Springer, 1997.
- "Protecting Intellectual Property by Excluding Infringing Imports: An Economist's View of Section 337 of the U.S. Tariff Act," *Patent World*, Issue 25 (September 1990): 29-35.
- Review Essay of: Jean Tirole, *The Theory of Industrial Organization*, MIT Press, 1988. *Managerial and Decision Economics*, Vol. 11 (May 1990): 131-139.
- Book Review of: J. Stiglitz and F. Mathewson eds., *New Developments in the Analysis of Market Structure*, MIT Press, 1988. *Journal of Economic Literature*, Vol. 36 (March 1988): 133-135.
- "Vertical Restraints," published in German by *Forschungsinstitut für Wirtschaftsverfassung und Wettbewerb* by E.V. Köln, Heft 5, 1984.

DISCUSSION PAPERS AND WORK IN PROGRESS

- "Towards Competition in International Satellite Services: Rethinking the Role of INTELSAT," paper distributed at OECD Ad Hoc Meeting of Experts on Competition in Satellite Services, Paris, June 1995 (with Joseph E. Stiglitz and Eric Wolff).
- "Competitive Markets in Generation: Economic Theory and Public Policy," paper presented at conference on "Electric Utility Restructuring: Whither Competition?" organized by International Association for Energy Economics Los Angeles Chapter, and Micronomics Inc., Los Angeles, May 1995.
- "Exclusive Dealing for Rent Extraction," mimeo, January 1994 (with Serge Moresi and Francis O'Toole).
- "Option Values of Deposit Insurance and Market Values of Net Worth: Some Evidence for U.S. Banks," mimeo, December, 1992 (with Behzad Diba and Chia-Hsiang Guo).

"Do Sunk Costs Discourage or Encourage Collusion?" U.S. Department of Justice, Antitrust Division, EPO Discussion Paper 85-10 (September 1985).

"Signalling Equilibria Based on Sensible Beliefs: Limit Pricing Under Incomplete Information," U.S. Department of Justice, Antitrust Division, EPO Discussion Paper 84-4 (May 1984) (with Maxim Engers).

OTHER SCHOLARLY ACTIVITIES

Seminars Presented

Belcore
Bureau of Competition Policy, Industry Canada
California State University, Hayward
Columbia University
ENSAE, Paris
Federal Trade Commission
Georgetown University
George Washington University
International Trade Commission
Johns Hopkins University
New York University
Pennsylvania State University
Simon Fraser University
Tulane University
U.S. Department of Justice
University of Alberta
University of British Columbia
University of Calgary
University of California, Davis
University of California, Los Angeles
University of Maryland
University of Montreal
University of Pennsylvania
University of Toronto
University of Virginia

Conferences: Speaker or Discussant

Economics of Interconnection Forum, Federal Communications Commission, Washington DC, May 1996
Authors' Symposium on Competition Policy and Intellectual Property Rights, Canadian Bureau of Competition, Aylmer, Quebec, May 1996
Electric Generation Association, Annual Meetings, West Palm Beach, April 1996
"Wheeling & Dealing: Opportunities and Challenges in the New Electric Industry," conference sponsored by the Center for Regulatory Studies, Illinois State University and the Institute of Government and Public Affairs, University of Illinois- Urbana, Chicago, April 1996
"New Social and Economic Approaches to a Multimedia World," OECD Symposium, Tokyo, March 1996
"Telecommunications and Energy Regulation in Transition Economies," Center for Economic Development, Bratislava, October 1995
"Electric Utility Restructuring: Whither Competition?" organized by International Association for Energy Economics Los Angeles Chapter, and Micronomics Inc., Los Angeles, May 1995.

"New Learning on Barriers to Entry in Competition Policy," Canadian Bureau of Competition, Ottawa,
 March 1995
 Southeastern Economic Theory Meetings, Charlottesville, October 1994
 EARIE Conference, Tel Aviv, September 1993
 Midwest International Economics Meetings, Pittsburgh, October 1992
 Latin American Econometric Society, Mexico City, September 1992
 Conference on Industrial Organization, Carleton University, Ottawa, July 1991
 Workshop on Strategic and Dynamic Aspects of International Trade, SUNY at Stony Brook, July 1991
 AEI Conference on "Innovation, Intellectual Property and World Competition," Washington DC, September
 1990
 EARIE Conference, Lisbon, September 1990
 Conference on "International Trade and Technology," Brussels and London, November 1989
 EARIE Conference, Budapest, August 1989
 Conference on Strategy and Market Structure, Dundee University, Dundee, August 1988
 Conference on "Firm Ownership and Competition," Graduate School of Business, Stanford University,
 June 1987
 EARIE Conference, Berlin, August 1986
 AEA Annual Meetings, Dallas, December 1984

Referee for Professional Journals

American Economic Review
Canadian Journal of Economics
Economica
Economic Journal
International Economic Review
International Journal of Industrial Organization
Journal of Business
Journal of Business Economics
Journal of Economic Dynamics and Control
Journal of Economic Theory
Journal of Economics and Management Strategy
Journal of Industrial Economics
Journal of Political Economy
Managerial and Decision Economics
Quarterly Journal of Economics
Quarterly Review of Economics and Business
RAND Journal of Economics
Review of Industrial Organization
Review of International Economics
Scandinavian Journal of Economics

Outside Evaluator—Research Proposals and Tenure & Promotion Cases

National Science Foundation
 Small Business Administration
 Several economics departments (identities disclosed on request)

EXHIBIT 3

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OFFICE OF THE SECRETARY

Affidavit of Michael J. Friduss on Behalf of the U. S. Department of Justice

**AFFIDAVIT OF MICHAEL J. FRIDUSS
ON BEHALF OF THE
U.S. DEPARTMENT OF JUSTICE**

I. PROFESSIONAL BACKGROUND

1. My name is Michael J. Friduss. My business address is 1555 Museum Drive, Highland Park, IL 60035. I am an independent consultant working with C.A. Hempfling & Associates, Inc., under contract with the Antitrust Division of the United States Department of Justice.

2. I received a Bachelor of Science degree in Industrial Engineering from the Illinois Institute of Technology in 1964 and a Masters degree in Management from Northwestern University in 1971.

3. I began my telecommunications career in 1964 as a Management Assistant for Illinois Bell Telephone Company ("Illinois Bell"). In this capacity, I filled a variety of non-management and management positions designed to familiarize me with all departments of the company.

4. From 1966 to 1969, I was a Manager in Illinois Bell's Plant Department. In this capacity, I supervised installation or repair operations in three different territories on the South side of Chicago.

5. In 1969, I was promoted to District Engineering Manager, responsible for the engineering and design of outside plant, also on Chicago's South side. In 1970, I was appointed District Plant Manager, responsible for installation and repair activities in Chicago's Hyde Park area. During my tenure in Hyde Park, I also headed an Operation Review team that assessed the quality and cost performance of each district in Chicago Operations.

6. I was promoted to Division Manager—Corporate Planning at AT&T in New York in 1973 and served through 1975. In this capacity, I headed a small group responsible for the study of the telecommunications interexchange industry at that time and what AT&T's future strategy should be in that segment of the industry.

7. In 1975, I returned to Illinois Bell as Division Plant Manager, responsible for installations and repair in the South suburban area. In 1978, I was named Division Manager—Corporate Planning for the company, responsible for Illinois Bell's planning and operations budgeting,

including operations planning for the implementation of the FCC's Computer Inquiry II and divestiture.

8. In 1983, I was promoted to General Manager—Distribution Services, responsible for Illinois Bell's outside operations, construction, and engineering. In this capacity, I supervised 7,000 employees and a budget of \$500 million.

9. In 1986, I was promoted to Vice President—Personnel and Support Services for Michigan Bell and in 1989 was named Vice President—Customer Sales and Service for the same company. In the latter role, I was chief operating officer of a company and a member of the Board of Directors, with responsibility for operations and sales, including 11,000 employees and expenditures in excess of \$1 billion.

10. In 1992, I returned to Ameritech Services as Vice President—Customer Service and Information Technology, responsible for the strategic and tactical direction of Ameritech's customer service and operations, as well as planning, building, and maintaining high quality and efficient computer systems (chief information officer). I retired from this position in 1993.

11. In late 1993, I formed MJ Friduss & Associates, consultants to the telecommunications industry. Our clients are carriers, primarily current and new local service providers, and small to medium-sized companies that provide hardware, software, and operating systems to those service providers. We are currently working with a number of firms in the areas of strategic planning, marketing, operations, customer services, and supplier management.

12. Additionally, I am Editor of the Friduss Report, a newsletter focused on carrier procurement processes.

II. SCOPE OF ASSIGNMENT

13. I have been asked by the Antitrust Division of the United States Department of Justice for my opinion regarding the appropriateness and comprehensiveness of the performance measures BellSouth proposes to provide to competitors and regulators. In particular, I have been asked whether these performance measures will reasonably depict the performance of wholesale functions BellSouth is obligated to perform pursuant to the competitive checklist of section 271 of the

Communications Act of 1934 (as amended by the Telecommunications Act of 1996) and whether such measures will enable competitors and regulators to determine both the adequacy of BellSouth's performance and the parity of such performance when compared to BellSouth's retail operation.

14. The primary source upon which I relied for my analysis is BellSouth's section 271 application for South Carolina. I generally reviewed the application for any discussion of performance measures. Additionally, I have reviewed:

- The FCC's Quality of Service report, which summarizes quality of service based on data submitted by the Bell Operating Companies (BOCs), GTE, and Sprint.
- BellSouth's application, including a Statement of Generally Available Terms (SGAT), before the South Carolina Public Service Commission (SCPSC) to provide interLATA telephone service in South Carolina.
- Testimony before the SCPSC related to BellSouth's application for entry into the interLATA toll market in South Carolina.
- The Telecommunications Act of 1996 (1996 Act).
- Interconnection agreements between the BOC and competitive local exchange carriers (CLECs) in South Carolina.
- Performance measure proposals by other BOCs, as well as proposals by several CLECs.
- The LCI/Comptel Petition for Expedited Rulemaking to Establish Reporting Requirements and Performance and Technical Standards for Operations Support Systems.
- My affidavit in connection with SBC Communication's Section 271 application for Oklahoma.
- The FCC's Opinion and Order on Ameritech's Section 271 application for Michigan.

15. I have also attended meetings with BellSouth and several CLECs interconnecting with or negotiating to interconnect with BellSouth.

16. Additionally, I have reviewed performance measures proposed by other BOCs in various proceedings in other states.

17. Finally, in reviewing BellSouth's proposals, I have drawn upon my significant experience with quality performance standards. As a telephone company line manager and officer, my performance was judged, in part, by how well I met customer service objectives. Further, as a staff manager, I had responsibility for the development and implementation of quality performance standards.

III. PERFORMANCE MEASURES AND THEIR ROLE

18. The 1996 Act obligates incumbent local exchange carriers (ILECs), and thus BOCs, to provide requesting carriers with interconnection, access to unbundled network elements, and resale services. In fulfilling these obligations, BOCs will perform a variety of wholesale functions for competitors, many of which BOCs also perform in providing retail services. Some of these functions, however, will be new.

19. The ability to detect discrimination in the performance of these functions is dependent on the establishment of performance measures that will allow competitors and regulators to measure BOC performance. Thus, the development of appropriate measures is critical to establishing that the local market is a level playing field in the context of the 1996 Act. Further, on an ongoing basis, the measures must be able to assure that the local market remains open and that any BOC backsliding will be detected.

20. Performance measures, then, serve as criteria for indicating performance, including the performance of wholesale functions. Performance measures enable competitors and regulators to compare a BOC's performance of a function with that provided to a BOC's retail customer or make an assessment of such function in the abstract. For example, to measure how well a BOC performs the functions of provisioning resold local service, we can define a performance measure—"average service provisioning interval"—and use it to describe the BOC's performance and to compare it to the BOC's retail performance of the same function. In general, performance measures are used to determine quality, measuring how long an activity takes to complete (cycle time) and how well the activity is performed (reliability).

21. A performance measure may include an objective or target, such as the cycle-time measure “five days to complete an order,” where overall the measure is a percentage of orders meeting or not meeting the target. A performance measure can also encompass a raw time interval, such as the average number of days to complete resale orders. In neither case, however, does the outcome of the measure—the percentage or cycle time—itsself indicate “good” performance or “bad” performance. Thus, performance measures themselves are not the barometers of performance, but rather the yardsticks with which to measure such performance. Accordingly, my review is limited to the sufficiency of BellSouth’s performance measures rather than the sufficiency of its performance.

22. The most competitively significant, and thus the highest-priority performance measures should be those that describe the end-to-end quality of service from the *customer’s* viewpoint. Studies over the years have identified performance measures that correlate highly with the customer’s perceptions of service quality, such as the percentage of repeat reports of trouble, while others have a lower correlation.

23. Finally, while performance measures are generally easy to identify, there is no universally accepted definition of what a measure proposes to reveal or specifically how to gather the necessary data that comprises the measure. For example, cycle-time performance measures are dependent on the specific definition of start and stop times, while reliability measures are dependant on the specific definition of what constitutes a failure. This affidavit does not attempt to specify these definitions. However, it is critical that BellSouth and interconnecting CLECs do so to ensure useful results. I have assumed that all parties will commit to reporting results that reflect the spirit, as well as the paper definition, of a performance measure. For example, in measuring the level of missed appointments, the result should be measured against the customer-requested due date; due date changes should only be considered where explicitly requested by the end user or explicitly agreed to by BellSouth and a CLEC.

24. As is discussed more fully below, my review of BellSouth’s proposed performance measures includes an assessment of (1) the scope of the functions measured; (2) the specific definitions of the measures; (3) the value and applicability of the measures through the appropriate

disaggregation of functions, markets, and products; (4) the stability of the measures; (5) the scalability of the measures; and (6) whether the proposed measures will allow CLECs and regulators to compare BellSouth's wholesale and retail performance of the functions measured.

A. BOC PERFORMANCE MEASURES TO DATE

25. Over the past 120 years, telephone companies have developed extensive measures of customer service. These performance measures have generally served two purposes: (1) to allow for the comparison of performance between managers, territories, organizations, and companies, and (2) to provide regulators with indicators of potential problems. These measures cover all areas of customer-affecting performance, including customer care, provisioning, repair, billing, and network maintenance. Regulatory requirements notwithstanding, these performance measures comprise a key indicator of management success. Objectives are set, data is gathered, reports are published, and results become part of the corporate, organizational, and individual success determination.

26. Using performance measures, most state public utility commissions require achievement of certain *levels* or standards of performance for customer service. For example, the SCPSC requires results reported for the following:

- Trouble reports per hundred access lines
- Customer out of service trouble clearing times
- Held orders over 30 days
- Percentage of service orders for installations and reinstallations completed within five working days.
- Percentage commitments fulfilled (missed appointments)
- Trunk failure rates
- Loop transmission measures:
 - DC line current
 - Circuit loss
 - Circuit noise
 - Power influence

- Balance
- Dialtone delay
- Toll and operator assistance call answer time
- Repair service answer time

27. The FCC requires the BOCs, GTE, and Sprint to submit quality-of-service data that is summarized annually in a report entitled “Quality of Service for the Local Operating Companies Aggregated to the Holding Company Level.” Without specifying particular levels, the report includes the following performance measures:

- Percent of installation appointments met
- Average missed installation in days
- Average repair interval
- Initial trouble reports per 1000 access lines
- Troubles found per 1000 access lines
- Repeat trouble as a percent of initial trouble reports
- Complaints per million access lines
- Switches with downtime
- Average switch downtime in seconds per switch
- Unscheduled downtime over 2 minutes per occurrence
- Scheduled downtime over 2 minutes per occurrence
- Trunk groups with blocking as a percent of total trunk groups

28. Thus, to date local exchange providers have reported on a significant list of measures of their retail performance. Given the new wholesale role imposed on ILECs by the 1996 Act and the many new functions to be performed in that role, some *new* performance measures will be required to both accurately describe existing performance and depict performance of new functions.

B. PARITY VERSUS ADEQUACY PERFORMANCE MEASURES

29. Under the wholesale/retail model imposed on ILECs by the 1996 Act, there are two categories of measurements used to depict ILEC performance of a particular function: parity

performance measurements and adequacy performance measurements. When a BOC's performance of certain functions for its retail units or "end user" customers is identical or analogous to the performance of those functions for competitors or their customers, parity performance measures apply. Parity performance measures are used to juxtapose performance results, such as comparing trouble report rates of a BOC's customers with those of a competitor's customers. Thus, parity performance measures are used for "apples-to-apples" comparisons and are most often applied in the resale environment, where the functions a BOC performs for a competitor's customers are almost identical to those performed for its own retail customers.

30. In contrast, adequacy performance measures facilitate the establishment of an objective or target pertaining to functions a BOC either (1) performs only for competitors, or (2) performs for competitors in a manner sufficiently different from that performed for the BOC itself such that a comparison is meaningless or unhelpful. Thus, adequacy performance measures apply in "apples-to-oranges" comparisons and facilitate a determination of whether CLECs are afforded a meaningful opportunity to compete. Adequacy measures apply primarily in the UNE environment.

C. MARKET AND PRODUCT DISAGGREGATION OF PARITY PERFORMANCE MEASURES

31. Meaningful determinations of parity performance require "apples-to-apples" comparisons of the functions performed by a BOC. Where, for example, the same function is performed by different personnel, with different facilities, or for different customer classes or products, more refined comparisons are required. Thus, for example, the function of installing POTS service for consumer and business customers may be identical, but because business customers may be more sensitive to installation delays, a meaningful comparison may require juxtaposition of only business customer installation intervals.

32. There are two general categories of such further disaggregation. First, market parity refers to equality between appropriate customer groups. Customer groups may be broken out geographically or by class of service. Geographic market parity means comparing CLEC results to BOC results within the geography the CLEC has chosen to offer service. For example, if a CLEC

offers resale service only in city A, a meaningful comparison may require the BOC to provide their retail results only for city A.

33. Class of service market parity means comparing CLEC results to BOC results within the classes of service the CLEC has chosen to offer. For example, if a CLEC offers service to small-business end users only, for purposes of comparison a BOC may have to provide its retail results for such small-business users.

34. A second category of disaggregation is product parity. Where the provision of different products to the same or different customer group requires use of different facilities, personnel, and so forth, meaningful parity comparisons may require disaggregation of performance results by the products offered by a CLEC. Product groups may further be broken out both by wholesale category and by specific products offered to end users. Wholesale categories include resale, UNE (possibly further broken out by loop-only, UNE combinations, and so forth), and facilities-based. Performance measures are required for each wholesale category. Specific products offered to end users include POTS, HICAP, Subrate, ISDN, or Centrex. For example, if a CLEC chooses to offer ISDN, a BOC could provide performance measurements that would allow for a comparison with their own ISDN retail product.

D. REPORTING REQUIREMENTS

35. Once appropriate performance measures have been agreed to and the data gathered, the results must be formatted into reports and provided to CLECs and regulators. My review will include proposed report formats, report frequency, the appropriateness of result comparisons, report accuracy and completeness, and the availability of raw data.

36. Report format relates to how performance measure results are presented. Are they presented in tabular or graphical form? Are they readable and understandable? Can a CLEC or regulator determine whether parity has been achieved? Report frequency relates to how often reports will be provided. Report accuracy and completeness relate to the statistical validity of the proposed data. Appropriateness of result comparisons relates to the entities for which the data will be provided: BOC retail? BOC subsidiaries? the CLEC? all CLECs? other?

IV. OVERVIEW OF BOC WHOLESALE FUNCTIONS

37. It is helpful to divide the functions BOCs will perform for CLECs under the 1996 Act into five primary categories: pre-ordering, ordering, provisioning, maintenance and repair, and billing functions. These categories describe the spectrum of functions through which CLECs acquire new customers, maintain facilities for them, and bill them. Within each category, performance measures identify the cycle time and reliability of each function. Performance parity is achieved if CLEC resale customers enjoy cycle time and reliability of functions equivalent to that experienced by the BOC's customers or its affiliates' customers. Performance adequacy is achieved if, for example, through the provision of network elements, CLECs are afforded a meaningful opportunity to compete.

38. Pre-ordering describes the initial process of a CLEC or BOC customer service representative obtaining information to place an order for new, additional, or changed service. Pre-order cycle-time performance measures generally refer to the reliability and response times of operations support systems (OSSs) that allow the representative to complete the service order with the customer on the line. Pre-order reliability performance measures refer to the accuracy and completeness of the data received. These pre-ordering functions are generally visible to the end user.

39. Ordering describes the process of the service representative transmitting the service order into the BOC's OSSs for facility assignment, database updates, switch updates, and dispatch of a technician, if required. For a CLEC, this includes successfully moving the service order across an agreed-upon interface into the BOC's OSSs. Ordering cycle-time performance measures refer to BOC response times for notices of order confirmation, jeopardy, or rejection. Ordering reliability performance measures refer to the accuracy and completeness of these notices, as well as the percentage of rejected orders. Ordering performance measures also address the percentage of service orders that "flow-through" from a service representative to completion if no technician dispatch is required or to the point of dispatch if dispatch is required. OSS availability and BOC service center answer time performance measures may also be considered to be part of the ordering process. Ordering is generally transparent to end users.

40. Provisioning involves the execution of a request for a set of products and services or unbundled network elements with attendant acknowledgments and status reports. Provisioning performance measures measure how quickly and well customer service orders are completed. Provisioning results are highly visible to end users and are critical to a determination of performance parity. Provisioning cycle-time performance measures refer to measuring the interval, from the end user's perspective, from order placement to order completion. Provisioning reliability performance measures refer to the accuracy of the work done (*i.e.*, did the end users receive what they ordered) and to the quality of the work done (*i.e.*, did everything work).

41. For purposes of this review, I have evaluated categories of repair and maintenance separately. Repair is the process by which end users report a case of trouble and the trouble is subsequently cleared. This process is highly visible to the end user and has a high correlation with the end user's perception of the service provider. Repair cycle-time performance measures depict the interval from end-user report to trouble clearance and notification. Repair reliability performance measures measure the quality of the repair operation.

42. Maintenance refers to how well the network itself is maintained, and associated performance measures generally refer to reliability rather than cycle time. The most visible performance measure is the mean time between troubles, often referred to as the trouble report rate. Other performance measures measure how well the BOC's switching and transmission elements are maintained.

43. Billing performance measures describe the speed, accuracy, and completeness of end-user usage data from the BOC to the CLEC. While the process may be transparent to the end user, the end product is highly visible.

44. There are several miscellaneous functions that must also be measured. These include toll and directory assistance operator services, directory listing, and 911 database updates.

V. REVIEW OF BELL SOUTH'S PROPOSED PERFORMANCE MEASURES

45. This part of the affidavit addresses the performance measures explicitly cited in BellSouth's application, performance measures included in existing interconnection agreements,

performance measures included in BellSouth's SGAT, and performance measures not explicitly or implicitly cited by BellSouth that are important to measuring functions required under the 1996 Act. Section A discusses BellSouth's commitment to providing CLECs with services at parity with its retail operations and performance measures that will show such parity. Section B reviews all such measures under the assumption that they would be reported, as discussed more fully below, to both competitors and regulators on an ongoing basis. In particular, Section B addresses the proposed performance measures for each wholesale process—pre-ordering, ordering, provisioning, repair and maintenance, and billing—described above. Sections C and D describe methods of disaggregating those performance measures to more accurately perform parity and adequacy assessments by market and product. Finally, Section E discusses the need for consistent and accurate reporting and highlights those measurements BellSouth has indicated will be reported to both competitors and regulators for purposes of this application.

46. Most of the resale performance measure examples discussed below are not new. Many are tracked and reported by BOCs for retail operations and are reported to state or federal regulatory bodies. At the same time, UNE performance measures, although similar to resale, measure the performance of wholesale functions that are new to the BOCs.

47. It is important to note that this affidavit is not an attempt to prescribe a model set of performance measures or an attempt to lay out a minimum set of performance measures that would meet the requirements of the 1996 Act. I discuss below historically and widely used, newly appropriate, or exemplary performance measures for each of the wholesale functions BOCs will perform under the 1996 Act, and variation from those discussed may be possible without necessarily impacting the ability to determine parity or adequacy of performance.

A. BELL SOUTH'S COMMITMENT TO PARITY

48. BellSouth's application for provision of in-region, interLATA service in South Carolina commits to equal quality of resale services and interconnection to new entrants and nondiscriminatory provision of unbundled elements (Stacy Performance Aff. ¶ 2). BellSouth further

commits to “collect all necessary data to demonstrate this fact” (Stacy Performance Aff. ¶ 86). It expressly proposes to provide the measures discussed below, which are broken out by process.

49. BellSouth states that its existing performance measures are more than adequate to allow for the detection of “non-discrimination” and “meaningful opportunity to compete” standards (Stacy Performance Aff. ¶ 3). These measurements are portrayed as being developed in three different formats: initial measurements, historically used by BellSouth Telecommunications (BST) and applied to BST and CLECs; AT&T measurements, contractually agreed to with AT&T; and permanent measurements, based on the AT&T measurements but with additions. (Stacy Performance Aff. ¶ 16)

50. BellSouth Telecommunications has created a new and separate officer-level organization responsible for all operational aspects of provisioning and maintenance of services provided to CLECs. Two Local Carrier Service Centers (LCSCs), available 24 hours a day 7 days a week, have been established to provide contact points for CLECs ordering resale or UNEs. Further, a Customer Support Manager is assigned to each CLEC as a single point of contact for CLECs whose customers have operational issues not resolved by normal processes. (Stacy Performance Aff. ¶ 4)

51. BellSouth’s SGAT filed with SCPSC contains a commitment to parity (SGAT § I. (I), (J)) but proposes no specific performance measures.

52. BellSouth has interconnection agreements with 83 telecommunications carriers in South Carolina. Two are included as exhibits to Stacy’s affidavit: the agreements with AT&T and Time Warner. BellSouth reached agreement with AT&T on performance measures as part of their agreement and filed these measures with the SCPSC (Stacy Performance Aff. ¶ 28). The two companies have agreed to extend these measures to all nine BellSouth states. Further, BellSouth and Time Warner have agreed to performance measures in their interconnection agreement, executed on September 5, 1997 (Stacy Performance Aff. Ex. WNS-5). Both these interconnection agreements contain additional performance measures that have not been proposed in BellSouth’s permanent measurements.

B. BELLSOUTH'S PROPOSED PERFORMANCE MEASURES

53. Pre-ordering: Pre-ordering performance measures revolve around the ability of a CLEC service representative to complete an order with an end user on line with at least the speed and accuracy of a BOC service representative taking a similar service order from a retail end user. Since CLEC service representatives will likely interface with BOC OSSs and with BOC service representatives, performance measures are needed to measure the cycle and reliability of both interactions. These measurements will ensure that BOC service representatives do not have an unfair advantage in creating a superior end-user perception of speed and efficiency. Typical pre-ordering performance measures include the following:

- **Pre-order OSS Availability:** Measures both the hours and days the BOC's pre-order OSSs are available to CLECs and non-scheduled downtime. This performance measure is important because it ensures that a CLEC, which may have different service center hours than the BOC, will have access to the systems and databases it requires when they are needed.
- **Pre-order System Response Times:** Measures, in seconds, the speed with which the CLEC Service Representatives receives information for processes described below with a customer on the line. These cycle-time measures assume the CLEC has mechanical access to the BOC databases and should be measured in a manner that allows appropriate comparisons to like cycle times experienced by BOC retail service representatives. They are important because customer perceptions of service are impacted by the speed and efficiency of their service center contact.
 - Address verification
 - Request for telephone number
 - Request for customer service record (CSR)
 - Service and product availability
 - Appointment scheduling

54. BellSouth has not proposed any pre-ordering performance measures in its permanent measurements, in its SGAT, or in interconnection agreements that I have reviewed.

55. Ordering: Ordering performance measures revolve around measuring the CLEC's ability to process end-user service orders placed with the BOC and delivered through the BOC's OSSs with speed and accuracy at least equal to the BOC itself. Ordering cycle time is primarily measured by the promptness of communications between the BOC and the CLEC. Ordering reliability is measured by the accuracy of the service order and by the success of order "flow-through." Typical ordering performance measures include the following:

- Firm Order Commitment (FOC) Cycle Time: Measures the time from CLEC service order submission to BOC response, confirming receipt of a properly formatted and appointed order. Can be presented as a mean interval or as the percentage returned within an agreed upon interval. This is an important measure because it helps depict whether CLEC service orders are processed in a manner which leads to overall provisioning interval parity.
- Rejected Order Cycle Time: Measures the time, from CLEC service order submission to BOC response, for rejecting an incomplete service order or one containing errors. Each submission of an order, up to and including the FOC, requires a response cycle-time result.
- Service Order Cycle Time: The average time it takes to process a CLEC service order, measured from the first time the order reaches the BOC interface to the order being placed in queue for completion. Comparisons can be made to equivalent BOC cycle times to assure the CLEC of processing parity. Service Order Cycle Time captures both reject and commitment intervals.
- Ordering Quality: The following performance measures, along with Service Order Cycle Time, are important determinants of service order processing parity or adequacy. Each is important in its own right and provides insights into different aspects of order quality; however, the entire set would not be required as a determinant of discrimination. For

example, Service Order Accuracy is likely to correlate highly with Percent Rejected Orders and with Order Submissions per Order.

- **Service Order Accuracy:** Measures the quality of service order up to the BOC gateway in terms of errors per service order. It tends to reflect more on the CLEC than on the BOC and would be difficult to track.
- **Percent Rejected Orders:** An important measure of order quality that reflects on both the BOC and the CLEC. Measured at the BOC gateway, it is the result of dividing rejected orders by total orders submitted, manually or mechanically. It is an adequacy measure because there are no equivalent BOC analogs. BOC orders are “rejected” via automatic edits before the order leaves the service representative position.
- **Order Submission per Order:** Another important determinant of order quality. Measured at the BOC gateway, it is determined by dividing total order submissions by the number of orders receiving a firm order commitment.
- **Percent Flow Through:** Measures the percentage of service orders that flow from the BOC gateway to completion queue without manual intervention. Flow-through can be a parity measure in a resale environment and an adequacy measure in a UNE environment. Unless reprogrammed, it is unlikely that BOC OSSs will discriminate between BOC and CLEC service orders. Therefore, although important as a determinant of processing efficiency and one that the BOCs have historically used for this purpose, it is unlikely that Percent Flow Through will prove either parity or discrimination.
- **Ordering OSS Availability:** Measures both the BOC ordering OSS hours of operation and the reliability of the systems.
- **Ordering Center Availability:** Measures the hours and days of operation of the BOC ordering center.

- Speed of Answer—Ordering Center: Measured in average time to reach a BOC service representative. This can be an important measure of adequacy in a manual environment or even in a mechanized environment where CLEC service representatives have a need to speak with their BOC peers.

56. BellSouth has proposed the following ordering performance measures:

- Firm Order Commitment (FOC) Cycle Time: Not yet available. Measures FOCs returned in less than 4, 6, 8, 12, 24 hours for orders that flow through without human intervention, excluding rejects (Stacy Performance Aff. Ex. WNS-8 ¶ 4b). Combines residence and business, but excludes any order requiring human intervention. This measure, as defined, should include *all* orders and should separate residence and business orders. FOC cycle-time performance measures are included in BellSouth's interconnection agreements with AT&T and Time Warner.
- Rejected Order Cycle Time: Not yet available. Measures percent rejected orders returned in less than one hour. Included in BellSouth's interconnection agreements with AT&T and Time Warner.

57. BellSouth has not included the following ordering performance measures either in its permanent measurements or in interconnection agreements that I have reviewed:

- Total Service Order Cycle Time
- Any measures of service order quality. All of the following are not required, but one or more is necessary to determine the reliability of the CLEC service order submission process:
 - Service Order Accuracy
 - Percent Rejected Orders
 - Order Submissions per Order
 - Percent Flow Through
- Ordering OSS Availability

- **Ordering Center Availability:** However, BellSouth has committed to 24 hours a day 7 days a week availability.
- **Speed of Answer—Ordering Center**

58. **Provisioning:** Provisioning performance measures depict how quickly and how accurately end-user service orders are completed. Parity in performing provisioning functions results in CLEC customers receiving service with speed and quality at least equal to that received by BOC retail or subsidiary customers. Provisioning measures have a long and detailed history within the BOCs. They are used to review and compare manager performance, as well as required by state and federal regulatory bodies. Provisioning is a process highly visible to end users and, therefore, is a key determinant to CLEC success in the marketplace. Typical provisioning performance measures include the following:

- **Service Provisioning Interval:** A critical determinant of provisioning parity or adequacy, the interval measures the time from customer request for service to completion when the appointment is offered by the BOC, either from a common appointment database, generally used in a resale environment, or by agreed-to appointment intervals, more commonly used in a UNE environment. Service Provisioning Interval should be measured both as a mean, or average interval, and as a percent over a standard interval. Only next available appointments offered from the work schedule OSS should be included for measurement. Customer-requested due dates, shorter or longer than the offered appointment, should be excluded.
- **Average Service Provisioning Interval:** Measured in days from end-user request to order completion and counted separately for dispatched and non-dispatched orders. Average interval is the more important of the two measures because it depicts the result for all orders rather than just the “tail,” or orders completed out of interval. For example, if the BOC completes 95% of its own retail service orders within 5 days and 95% of a CLEC’s resale orders within 5 days, it is possible that the mean

interval for the BOC retail orders could be significantly different (higher or lower) than the CLEC's orders.

Provisioning in a resale environment calls for parity performance measures, while provisioning in a UNE environment generally calls for adequacy performance measures. Some UNE processes are more analogous to BOC retail processes than others; however, statistically valid performance parity comparisons require mirrored processes provided to the CLEC and to BOC retail customers. Thus:

- **BOC Retail to CLEC Resale Migration:** When a customer is moving from BOC retail service to CLEC resale, provisioning interval is a parity performance measure, comparing equivalent processes from the customer's viewpoint.
- **No Service to CLEC Resale Migration:** Provisioning interval is a parity measure, comparable to new service offered by the BOC to its retail customers.
- **BOC Retail to CLEC UNE Migration:** When a customer is moving from BOC retail service to CLEC UNE-based service, provisioning interval is likely to be an adequacy measure used to indicate whether the CLEC is providing a "meaningful opportunity to compete." UNE loop provisioning clearly calls for such measures because of the non-analogous functions provided to the CLEC. UNE platform provisioning is less clear. On one hand, an end-to-end combination of elements may look like resale to the end user and provisioning of such a combination may require analogous BOC software changes only. At the same time, the BOC may have internal network element inventory or other changes to make that would render the overall process non-analogous.
- **No Service to CLEC UNE Migration:** A provisioning adequacy performance measure.
- **CLEC Resale to CLEC UNE Migration:** When a CLEC chooses to move a customer from resale to UNE (loop, combination, or platform), the move may